

Department of Mechanical Engineering
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Bucknell University
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PROFESSIONAL APPOINTMENTS

Bucknell University (Lewisburg, PA) 2017 – Present
Assistant Professor
Department of Mechanical Engineering

Geisinger Commonwealth School of Medicine (Scranton, PA) 2021 – Present
Adjunct Assistant Professor of Orthopaedics
Musculoskeletal Institute

EDUCATION

Ph.D., Mechanical Engineering 2017
Colorado State University (Fort Collins, CO)
Dissertation: Finite element analysis of skeletal muscle: A validated approach to modeling muscle force and intramuscular pressure.

B.S., Engineering 2011
Trinity College (Hartford, CT)

PUBLICATIONS

Refereed Journal Articles

- 24. Wheatley, B. B.**, Gilmore, E. C., Fuller, L. H., Drake, A. M., & Donahue, S. W. (2023). How the geometry and mechanics of bighorn sheep horns mitigate the effects of impact and reduce the head injury criterion. *Bioinspiration & Biomimetics*. doi: 10.1088/1748-3190/acb478
- 23. Dyer, O. L., Wheatley, B. B.**, & Seeley, M. A. (2023). Short-term vancomycin and buffer soaking does not change rabbit achilles tendon tensile material properties. *Clinical Biomechanics*. doi: 10.1016/j.clinbiomech.2023.105874
- 22. Wheatley, B.B.**, Chaclas, N.A., & Seeley, M.A. (2022). Patellofemoral Joint Load and Knee Abduction/Adduction Moment are Sensitive to Variations in Femoral Version and Individual Muscle Forces. *Journal of Orthopaedic Research*. doi: 10.1002/jor.25396
- 21. Habibian, S., Wheatley, B.B.**, Bae, S., Shin, J., Buffinton, K.W. (2022). Evaluation of two complementary modeling approaches for fiber-reinforced soft actuators. *ROBOMECH Journal*. 9,(2). doi: 10.1186/s40648-022-00225-9
- 20. Lavigne, T., Sciumè, G., Laporte, S., Pillet, H., Urcun, S., Wheatley, B.B.**, & Rohan, P.Y. (2022). Numerical investigation of the time-dependent stress-strain mechanical behaviour of skeletal muscle tissue in the context of pressure ulcer prevention. *Clinical Biomechanics*. 105592. doi: 10.1016/j.clinbiomech.2022.105592

19. Geswell, M., Sinha, N., Mandel, M., **Wheatley, B.B.**, Mirenda, W., & Seeley, M. (2021). Improving Resident Education Through Unstable Chicken Hips. *Journal of Pediatric Orthopaedics B*. doi: 10.1097/BPB.0000000000000762
18. Aguirre, T.G., Fuller, L.H., Ingle, A., Seek, T.W., **Wheatley, B.B.**, Steineman, B.D., Haut Donahue, T.L., & Donahue, S.W. (2020). Bioinspired material architectures from bighorn sheep horncore velar bone for impact loading applications. *Scientific Reports*. 10, 18916. doi: 10.1038/s41598-020-76021-5
17. **Wheatley, B.B.** (2020). Investigating Passive Muscle Mechanics with Biaxial Stretch. *Frontiers in Physiology*. doi: 10.3389/fphys.2020.01021
16. Grega, K.L., Segall, R.S., Vaidya, A.J., Fu, C., & **Wheatley, B.B.** (2020). Anisotropic and Viscoelastic Tensile Mechanical Properties of Aponeurosis: Experimentation, Modeling, and Tissue Microstructure. *Journal of the Mechanical Behavior of Biomedical Materials*. 110, 103889. doi: 10.1016/j.jmbbm.2020.103889
15. Mayers, A.J., Hayes, D., **Wheatley, B.B.**, Seeley, M.A., & Widmaier, J. (2020). Surgical/Technical Tips SCFE Screw Removal with Coring Reamer. *JPOSNA* 2(1).
14. Vaidya, A.J. & **Wheatley, B.B.** (2019). An experimental and computational investigation of the effects of volumetric boundary conditions on the compressive mechanics of passive skeletal muscle. *Journal of the Mechanical Behavior of Biomedical Materials*. 102, doi: 10.1016/j.jmbbm.2019.103526
13. Sinha, N., Cornell, M., **Wheatley, B.B.**, Munley, N. & Seeley, M. (2019). Looking Through a Different Lens: Patient Satisfaction with Telemedicine in Delivering Pediatric Fracture Care. *Journal of the American Academy of Orthopaedic Surgeons Global Research & Reviews*. 3(9), e(100). doi: 10.5435/JAAOSGlobal-D-19-00100
12. Wolynski, J., **Wheatley, B.B.**, & Haut Donahue, T.L. (2019). Finite Element Analysis of the Jaipur Foot: Implications for Design Improvement. *Journal of Prosthetics & Orthotics*. doi: 10.1097/JPO.0000000000000253
11. **Wheatley, B.B.**, Odegard, G.M., Kaufman, K.R., & Haut Donahue, T.L. (2018). Modeling Skeletal Muscle Stress and Intramuscular Pressure: A Whole Muscle Active-Passive Approach. *Journal of Biomechanical Engineering*. 140(8), 081006. doi: 10.1115/1.4040318
10. Teater, R.H., Fischenich, K.M., **Wheatley, B.B.**, Abrams, L., Sorby, S.A., Singh Mali, H., Jain, A., & Haut Donahue, T.L. (2018). Assessment of the compressive and tensile mechanical properties of materials used in the Jaipur Foot prosthesis. *Prosthetics & Orthotics International*. doi: 10.1177/0309364618767143
9. **Wheatley, B.B.**, Fischenich, K.M., Abrams, L.A., Sorby, S.A., Singh Mali, H., Jain, A. K., & Haut Donahue, T.L. (2017). An International Fellowship Experience for Engineering Undergraduates: Improving Technical, Teamwork, and Cultural Competency. *International Journal of Engineering Education*. 33(4), 1189-1198.
8. **Wheatley, B.B.**, Odegard, G.M., Kaufman, K.R., Haut Donahue, T.L. (2017). A validated model of passive skeletal muscle to predict force and intramuscular pressure. *Biomechanics and Modeling in Mechanobiology*. 16(3), 1011-1022. doi: 10.1007/s10237-016-0869-z.
7. **Wheatley, B.B.**, Odegard, G.M., Kaufman, K.R., & Haut Donahue, T.L. (2017). A case for poroelasticity in skeletal muscle finite element analysis: experiment and modeling. *Computer Methods in Biomechanics and Biomedical Engineering*. 20(6), 598-601. doi: 10.1080/10255842.2016.1268132.
6. Drake, A.M., Haut Donahue, T.L., Stansloski, M., Fox, K., **Wheatley, B.B.**, & Donahue, S. W. (2016). Horn and horncore trabecular bone of bighorn sheep rams absorbs impact energy and

reduces brain cavity accelerations during high impact ramming of the skull. *Acta Biomaterialia*. 136(11), 41-50. doi: 10.1016/j.actbio.2016.08.019

5. Wheatley, B.B., Odegard, G.M., Kaufman, K.R., & Haut Donahue, T.L. (2016). How does tissue preparation affect skeletal muscle transverse isotropy? *Journal of Biomechanics*. 49 (13): 3056–3060. doi: 10.1016/j.jbiomech.2016.06.034.

4. Wheatley, B.B., Pietsch, R.B., Haut Donahue, T.L., & Williams, L.N. (2016). Fully non-linear hyper-viscoelastic modeling of skeletal muscle in compression. *Computer Methods in Biomechanics and Biomedical Engineering*. 19(11), 1181-1189. doi: 10.1080/10255842.2015.1118468

3. Wheatley, B.B., Morrow, D.A., Odegard, G.M., Kaufman, K.R., & Haut Donahue, T.L. (2016). Skeletal muscle tensile strain dependence: hyperviscoelastic nonlinearity. *Journal of the Mechanical Behavior of Biomedical Materials*. 53, 445-454. doi: 10.1016/j.jmbbm.2015.08.041

2. Wheatley, B.B., Fischenich, K.M., Button, K.D., Haut, R.C., & Haut Donahue, T.L. (2015). An optimized transversely isotropic, hyper-poro-viscoelastic finite element model of the meniscus to evaluate mechanical degradation following traumatic loading. *Journal of Biomechanics*. 48(8), 1454-1460. doi: 10.1016/j.jbiomech.2015.02.028

1. Pietsch, R., Wheatley, B.B., Haut Donahue, T.L., Gilbrech, R., Prabhu, R., Liao, J., & Williams, L.N. (2014). The anisotropic compressive properties of porcine muscle tissue. *Journal of Biomechanical Engineering*. 136(11), 111003. doi: 10.1115/1.4028088

Refereed Conference Papers

6. Salyards, K.A., Wakabayashi, K., & Wheatley, B.B., (2022) Redesigning an Introduction to Engineering Course as an Interdisciplinary Project-Based Course. *2022 First Year Engineering Experience*. East Lansing, MI.

5. Wheatley, B.B. (2020) Appropriate Finite Element Analysis in Mechanical Engineering: Teaching Best Practices Through Simulation. *American Society of Engineering Education*. Virtual.

4. Wheatley, B.B., Miskioglu, E., Christou, E., Tymvios, N. (2020) Pre and Post Tenure: Perceptions of Requirements and Impediments for Mechanical Engineering and Mechanical Engineering Technology Faculty. *American Society of Engineering Education*. Virtual.

3. Buffinton, K. B., Wheatley, B.B., Habibian, S., Shin, J., Cenci, B.H., & Christy, A.E. (2020) Investigating the Mechanics of Human-Centered Soft Robotic Actuators with Finite Element Analysis. *RoboSoft*. Virtual.

2. Wheatley, B.B., Fischenich, K.M., Abrams, L.A., Sorby, S.A., Singh Mali, H., Jain, A.K., & Haut Donahue, T.L. (2017) Improvement of an International Research Experience: Year Two. *American Society of Engineering Education*. Columbus, OH.

1. Wheatley, B.B., Haut Donahue, T.L., & Catton, K.B. (2017) An Active Learning Environment to Improve First-Year Mechanical Engineering Retention Rates and Software Skills. *American Society of Engineering Education*. Columbus, OH.

Conference Proceedings

46. Wheatley, B.B., Dyer, O.L., & Seeley, M.A. Aponeurosis Heterogeneous Material Properties: Evidence and Implications for Muscle Strain. (2023). *Computer Methods in Biomechanics and Biomedical Engineering*. Paris, France.

45. Clarke, A.K., Wheatley, B.B., & Ahn, C. Detecting Muscle Fatigue in Surface EMG Data Through Topological Data Analysis. (2023). *Computer Methods in Biomechanics and Biomedical Engineering*. Paris, France.

44. Dyer, O.L., Seeley, M.A., & **Wheatley B.B.** Short-Term Buffer and Antibiotic Soaking Does Not Affect Tendon Modulus and Toe-Region Length. (2023). *The Orthopaedic Research Society*. Dallas, TX.
43. **Wheatley B.B.**, Dyer, O.L., & Seeley, M.A. Aponeurosis Structure-Function Mechanisms: Inhomogeneity of Microstructure Waviness and Materials Properties. (2023). *The Orthopaedic Research Society*. Dallas, TX.
42. Vandenberg N., Stoneback J., Christiansen C., Awad M., Melton D., **Wheatley B.**, & Gaffney B. Predicting Effects of Muscle Strength Changes on Joint Loading after Transfemoral Osseointegrated Prostheses. (2023). *The Orthopaedic Research Society*. Dallas, TX.
41. Voigt, M.J., Chaclas, N.A., Seeley, M.A., & **Wheatley, B.B.** (2022). Modeling the Effects of Femoral Anteversion and Miserable Malalignment on Hip Joint Loads. Biomedical Engineering Society Annual Meeting. San Antonio, TX.
40. Mayers, A.J., Hayes, D., Chaclas, N.A., Grega, K., Vogel, M., Seeley, M.A., & Wheatley, B.B. (2022). Comparing Removal Torques Between Partially and Fully Threaded SCFE Screws. *Society of Military Orthopaedic Surgeons Annual Meeting*. Scottsdale, AZ.
39. Bhuiyan, M.U. & **Wheatley, B.B.** (2022). Tensile Stiffness of Skeletal muscle Under Uniaxial Versus Biaxial Stretch. *Summer Biomechanics, Bioengineering, & Biotransport Conference*. Cambridge, MD.
38. Seeley, M., Koshinski, J., Saloky, K., Cornell, M., **Wheatley, B.**, & Harding, J. (2022). Understanding Pain Coping Strategies and their Potential Application to Pediatric Orthopaedics. *Pediatric Orthopedic Society of North America Annual Meeting*. Vancouver, BC.
37. Chaclas, N., Grega, K., Vogel, M., Mayers, A. Seeley, M., & **Wheatley, B.B.** (2022). Clinically Relevant Variations in Surgical Screw Properties. *Pediatric Orthopedic Society of North America Annual Meeting & American Academy of Orthopaedic Surgeons Annual Meeting*. Vancouver, BC & Chicago, IL.
36. Chaclas, N., Grandizio, L., Seeley, M., & **Wheatley, B.B.** (2022). Eye of the Carpenter: How Well do Orthopaedic Surgery Residents and Faculty Estimate Angular Measurements in Derotational Osteotomies? *Pediatric Orthopedic Society of North America Annual Meeting & American Academy of Orthopaedic Surgeons Annual Meeting*. Vancouver, BC & Chicago, IL.
35. Lavigne, T.J.H., Sciumè, Laporte, S., Pillet, H., Urcun, S., **Wheatley, B.B.**, & Rohan, P.Y. (2021-2022) The possible role of poro-elasticity in the apparent viscoelastic behaviour of passive muscle under confined compression. *Société de Biomécanique Congress. St. Etienne, France. & World Congress of Biomechanics*. Taipei, Taiwan.
34. Dyer, O.L., Seeley, M.A., & **Wheatley, B.B.** (2021-2022). Visual Characterization of Aponeurosis Microstructure. *Biomedical Engineering Society Annual Meeting*. Virtual. & *Summer Biomechanics, Bioengineering, & Biotransport Conference*. Cambridge, MD.
33. Lorza, S.S., Seeley, M.A., Rohan, P.Y., & **Wheatley, B.B.** (2021-2022). The Relationship Between Compression and Intramuscular Pressure of Skeletal Muscle. *Biomedical Engineering Society Annual Meeting*. Virtual. & *Summer Biomechanics, Bioengineering, & Biotransport Conference*. Cambridge, MD.
32. **Wheatley, B.B.** & Seeley, M.A. (2021). Modeling the Effect of Femoral Anteversion on Gait Dynamics. *Meeting of the American Society of Biomechanics & International Society of Biomechanics Technical Group on Computer Simulation*. Virtual (both).
31. Tully, E.E. & **Wheatley, B.B.** (2021). Location Dependent Mechanical Behavior of Aponeurosis Tissue Under Uniaxial Tensile Stretch. *Summer Biomechanics, Bioengineering, and Biotransport Conference*. Virtual.

30. **Wheatley, B.B.**, Drake, A.M., Fuller, L.H., & Donahue, S.W. (2021). Modeling the Effect of Bighorn Sheep Horn Shape on Post-Impact Accelerations. *Summer Biomechanics, Bioengineering, and Biotransport Conference*. Virtual.
29. Mandel, M., Seeley, M., **Wheatley, B.**, Woo, B., Young, A., Fabricant, P. D., & Cornell, M. (2020). Genu Valgum and Obesity in the Pediatric Patient. *American Academy of Pediatric National Conference*. Virtual.
28. Vaidya, A.J. & **Wheatley, B.B.** (2020). Novel Volumetric Compression Relaxation Testing of Skeletal Muscles. *Biomedical Engineering Society Annual Meeting*. Virtual.
27. Gilmore, E.C., Fuller, L.H., Drake, A.M., Aguirre, T.G., Ingrole, A.A., Donahue, S.W., & **Wheatley, B.B.** (2020). Shape Characterization of Bighorn Sheep Horns for Bending and Impact Implications. *Meeting of the American Society of Biomechanics*. Virtual.
26. **Wheatley, B.B.** & Seeley, M.A. (2020). Modeling the Effect of Femoral Anteversion on Knee Extensor Muscle Force and Anterior Knee Mechanics. *Meeting of the American Society of Biomechanics*. Virtual.
25. Mandel, M., Woo, B., Young, A., Fabricant, P. **Wheatley, B.**, Seeley, M. (2020). Genu Valgum and Obesity in the Pediatric Patient. *American Academy of Pediatrics National Conference & Exhibition*. Virtual.
24. Vaidya, A.J. & **Wheatley, B.B.** (2020). Development and Implementation of Volumetric Compression Relaxation Testing of Skeletal Muscle. *Summer Biomechanics, Bioengineering, and Biotransport Conference*. Virtual.
23. Grega, K.L., Fu, C., & **Wheatley, B.B.** (2020). Biaxial Tensile Mechanics of Aponeurosis Tissue. *Summer Biomechanics, Bioengineering, and Biotransport Conference*. Virtual.
22. **Wheatley, B.B.** & Fu, C. (2020) The Role of Biaxial Stretch in Elucidating Passive Muscle Mechanics. *Summer Biomechanics, Bioengineering, and Biotransport Conference*. Virtual.
21. **Wheatley, B.B.**, Yancey, M.E., & Seeley, M.A. (2020). A Musculoskeletal-Finite Element Framework for Modeling the Effect of Femoral Anteversion on Knee Extensor Muscle Force and Anterior Knee Mechanics. *CAMS-KNEE OpenSim Workshop and Conference*. Zurich, Switzerland. Poster Award Runner-Up.
20. Nester J., Torino D., Sylvestre D., Ney S., **Wheatley B.B.**, Seeley M. (2019). Risk of Reoperation After Primary ACL Reconstruction in Pediatric Patients. *Eastern Orthopaedic Association Annual Conference*, West Palm Beach, FL.
19. Vaidya, A.J. & **Wheatley, B.B.** (2019). Effects of Volumetric Boundary Conditions on the Compressive Mechanics and Modeling of Passive Skeletal Muscle. *Summer Biomechanics, Bioengineering, and Biotransport Conference*. Seven Springs, PA. BS Level Competition 3rd Place.
18. Grega, K. L. & **Wheatley, B.B.** (2019). Determination of the Linear Viscoelastic Behavior of Aponeurosis. *Summer Biomechanics, Bioengineering, and Biotransport Conference*. Seven Springs, PA.
17. **Wheatley, B.B.**, Yancey, M.E., & Seeley, M.A. (2019) Patellofemoral Contact Mechanics in Nail-Patella Syndrome and High Femoral Anteversion Morphology – Finite Element Modeling. *The Orthopaedic Research Society*. Austin, TX.
16. Vaidya, A.J. & **Wheatley, B.B.** (2018). Effects of Boundary Conditions on the Stress Relaxation of Passively Compressed Skeletal Muscle. *Biomedical Engineering Society Annual Meeting*. Atlanta, GA.
15. Geswell M., Sinha N., **Wheatley B.B.**, Mirenda, W.M. & Seeley M.A. (2018) Teaching the infant hip exam: A novel approach. *Eastern Orthopaedic Association Annual Conference*.

Amelia Island, FL.

14. **Wheatley, B.B.**, Odegard, G.M., Kaufman, K.R., & Haut Donahue, T.L. (2018). Finite Element Analysis of Intramuscular Pressure in Passive *in Vivo* Human Skeletal Muscle. *World Congress of Biomechanics*. Dublin, Ireland.
13. **Wheatley, B.B.** (2018). Investigating the Variability of Passively Stretched Skeletal Muscle with a Functional Morphological Fiber Model. *World Congress of Biomechanics*. Dublin, Ireland.
12. **Wheatley, B.B.**, Odegard, G.M., Kaufman, K.R., & Haut Donahue, T.L. (2017). Finite Element Analysis of Intramuscular Pressure in the Human Tibialis Anterior. *American Society of Biomechanics*. Boulder, CO.
11. **Wheatley, B.B.**, Odegard, G.M., Kaufman, K.R., & Haut Donahue, T.L. (2017). Finite Element Modeling of Active Skeletal Muscle: Muscle Force and Intramuscular Pressure. *Summer Biomechanics, Bioengineering, and Biotransport Conference*. Tucson, AZ. PhD Level Competition Finalist.
10. Kaufman, K.R, Go, S. A., O'Connor, S.A., **Wheatley, B. B.**, Litchy, W. J., Haut Donahue, T.L., Odegard, G.M., Ward, S.R., & Lieber, R.L. (2016). Quantitative Muscle Force Measurement using Intramuscular Pressure. *Biomedical Engineering Society Annual Meeting*. Minneapolis, MN.
9. **Wheatley, B.B.**, Odegard, G.M., Kaufman, K.R., & Haut Donahue, T.L. (2016). A Novel and Validated Finite Element Model of Passively Stretched Skeletal Muscle. *European Society of Biomechanics*. Lyon, France.
8. **Wheatley, B.B.**, Odegard, G.M., Kaufman, K.R., & Haut Donahue, T.L. (2016). Skeletal Muscle Permeability: Direct Experimental Evaluation and Modeling Implications. *Summer Biomechanics, Bioengineering, and Biotransport Conference*. National Harbor, MD.
7. **Wheatley, B.B.**, Odegard, G.M., Kaufman, K.R., & Haut Donahue, T.L. (2016). Anisotropy and Rigor Effects of Skeletal Muscle. *The Orthopaedic Research Society*. Lake Buena Vista, FL.
6. **Wheatley, B.B.**, Morrow, D.A., Odegard, G.M., Kaufman, K.R., & Haut Donahue, T.L. (2015). Predicting the Stress and Intramuscular Pressure Response of Whole Skeletal Muscle Through Optimized Finite Element Analysis. *Summer Biomechanics, Bioengineering and Biotransport Conference*. Snowbird Resort, UT.
5. **Wheatley, B.B.**, Pietsch, R., Donahue, T.L., & Williams, L.N. (2015). Numerical Modeling of Skeletal Muscle Under High Strain and Stress Relaxation Compression Conditions. *Summer Biomechanics, Bioengineering and Biotransport Conference*. Snowbird Resort, UT.
4. **Wheatley, B.B.**, Morrow, D.A., Odegard, G.M., Kaufman, K.R., & Haut Donahue, T.L. (2014). Inverse Finite Element Analysis for Poroelastic Material Properties of Excised Skeletal Muscle. *World Congress of Biomechanics*. Boston, MA.
3. Drake, A.M., **Wheatley, B.B.**, Kaufman, K.R., & Haut Donahue, T.L., (2014) Hydraulic Permeability of Rabbit Muscle Transverse to Contraction Direction. *Rocky Mountain Regional American Society of Biomechanics*. Estes Park, CO.
2. **Wheatley, B.B.**, Fischenich, K.M., Haut, R.C., & Haut Donahue, T.L. (2014) Mechanical Properties of Healthy and Damaged Menisci through Finite Element Analysis of Indentation. *The Orthopaedic Research Society*. New Orleans, LA.
1. **Wheatley, B.B.**, Morrow, D.A., Odegard, G.M., Kaufman, K.R., & Haut Donahue, T.L. (2013). Poroelastic Material Properties of Skeletal Muscle through Inverse Finite Element Method. *Rocky Mountain Regional American Society of Biomechanics*. Estes Park, CO.

PubMed:

https://www.ncbi.nlm.nih.gov/sites/myncbi/1vi_od97smYQJ/bibliography/45973042/public/?sortby=pubDate&sdirection=descending

Google Scholar:

<https://scholar.google.com/citations?user=JOaYOUIAAAAJ&hl=en>

HONORS AND AWARDS**Titles and Fellowships**

Assistant Professor Geisinger Musculoskeletal Institute	2019 – 2020
Visiting Assistant Professor Stanford University, OpenSim Visiting Scholars Program	2019
John P. and Mary Jane Swanson Professor of Engineering and the Sciences Bucknell University	2017 – 2020
Government of Ireland Postdoctoral Fellowship (Declined) Irish Research Council	2017 – 2019

Awards

Best Poster Runner-Up CAMs-Knee OpenSim Workshop	2020
PhD Competition Finalist - Tissue Mechanics and Characterization Summer Biomechanics, Bioengineering, and Biotransport Conference	2017
Best Graduate Student Podium Presentation Award Rocky Mountain American Society of Biomechanics	2017
College of Engineering Graduate Teaching Fellowship Colorado State University	2016 – 2017
Global Impact Research Top Scholar Colorado State University Graduate Student Showcase	2015
Shrake Culler Scholarship Colorado State University	2015
Joseph L. Guire Memorial Scholarship Colorado State University	2012

GRANTS**Bucknell University**

7. National Science Foundation Engineering Research Initiation <i>ERI: A Computational and Experimental Approach to Establishing Multiscale and Multiphasic Structure-Function Mechanisms of Muscle Stiffness</i> Role: PI Award Total: \$200,000 (Pending)	2023 – 2025
6. Bucknell-Geisinger Research Initiative <i>Biomechanical characterization of Ponseti Bracing treatment of clubfoot</i> Role: co-I Award Total: \$20,000 (Awarded)	2022 – 2023
5. Bucknell-Geisinger Research Initiative <i>A new approach to characterizing human motor control architecture for improved stroke</i>	2021 – 2022

rehabilitation

Role: PI Award Total: \$19,738 (Awarded)

4. Toyota Research Institute 2019 – 2020
 Subcontract to TRI-UM Project: *Don't Bite the Hand that Feeds You: Soft Robotics for the Eldercare II*

Role: co-PI Award Total: \$30,055 (Awarded)

3. Bucknell-Geisinger Research Initiative 2019 – 2023
Characterization and Modeling of Miserable Malalignment Syndrome Lower Limb Biomechanics

Role: PI Award Total: \$100,000 (Awarded)

2. National Science Foundation Major Research Instrumentation 2018 – 2019
Acquisition of a Planar Biaxial Material Testing System for Enhancement of Research and Teaching at Bucknell University

Role: PI Award Total: \$123,789 (Awarded)

1. Bucknell-Geisinger Research Initiative 2018 – 2019
Computational Modeling of Pediatric High Femoral Anteversion and Knee Biomechanics

Role: PI Award Total: \$19,947 (Awarded)

CAMPUS TALKS**External Invited Talks**

Geisinger Commonwealth School of Medicine	2022
Department of Medical Education Grand Rounds	
<i>From Computation to the Clinic: The Roles of Biomechanics, Modeling, Mentorship, and Collaboration in Orthopaedic Research</i>	
Institut de Biomécanique Humaine Georges Charpak, Arts et Métiers ParisTech	2021
<i>Structure-Function Mechanisms in Passive Muscle Mechanics</i>	
Stanford University	2019
<i>OpenSim Visiting Scholars Presentation at Neuromuscular Biomechanics Lab</i>	
Western Michigan University	2019
Department of Mechanical Engineering Seminar	
<i>From Computation to the Clinic</i>	

TEACHING EXPERIENCE**Bucknell University**

MECH 353 – Solid Mechanics	2021 – 2023
MECH 302 – Finite Element Analysis	2018, 2019
MECH 401 & 402 – Senior Design	2020 – 2021
MECH 471 – Nonlinear Solid Mechanics	2018
ENGR 100 – Exploring Engineering	2017, 2018, 2020 – 2023
Co-Coordinator, 2021 – Present	
ENGR 452 & 453 – Interdisciplinary Senior Design	2021 – 2023

Colorado State University

The Institute for Learning and Teaching – Teaching Certificate Program	2016 – 2017
MECH 103 – Introduction to MECH (Graduate Teaching Fellow)	2016 – 2017

MECH 495 – Independent Study, The Jaipur Foot (Graduate Instructor) 2016 – 2017

RESEARCH EXPERIENCE

Bucknell University 2017 – Present
Principal Investigator, Mechanics and Modeling of Orthopaedic Tissues Laboratory

Colorado State University 2012 – 2017
Graduate Research Assistant, Soft Tissue Mechanics Laboratory

480 Biomedical, Inc. (Watertown, MA) 2011 – 2012
Engineering Intern, Design Team

SERVICE TO PROFESSION

Grant Reviewer
National Institutes of Health 2022
Musculoskeletal Rehabilitation Sciences Study Section

Conference Moderator
Computer Methods in Biomechanics and Biomedical Engineering 2023
Summer Biomechanics, Bioengineering, and Biotransport Conference 2022
Meeting of the American Society of Biomechanics 2020

Journal Peer Reviewer
Acta Biomaterialia, Journal of Biomechanics, Journal of the Mechanical Behavior of Biomedical Materials, Journal of Biomechanical Engineering, Clinical Biomechanics, IEEE Transactions on Biomedical Engineering, PLOS ONE, Journal of Applied Biomechanics

Conference Peer Reviewer
Computer Methods in Biomechanics and Biomedical Engineering 2023
Summer Biomechanics, Bioengineering, and Biotransport Conference 2017 – Present
American Society of Engineering Education Annual Conference 2016 – Present
American Society of Biomechanics East Coast Meeting 2020
First-Year Engineering Experience 2022

Outreach
Board Member, Central Pennsylvania Girls on the Run 2020 – 2021
Lewisburg Children's Museum Engineering Camp 2019 – 2021
American Society of Biomechanics National Biomechanics Day 2016

SERVICE TO UNIVERSITY

Bucknell University
College of Engineering Graduate Committee 2018 – Present
Chair, 2022
Advisory Committee for the Bucknell Farm 2022 – Present
Working Groups for an Inclusive Engineering Community 2020 – 2022

Residential Colleges Steering Committee	2021 – 2022
Committee on Campus and Student Life	2021
Team Mentor – Men’s and Women’s Cross Country	2018 – Present
NSF CAREER Grant Writing May Plan Co-Organizer	2019, 2020

Colorado State University

Graduate Student Council, VP of Finance	2015 – 2017
Mechanical Engineering Graduate Ambassador	2016 – 2017
Colorado State University Graduate Showcase Moderator	2015 – 2016

RESEARCH MENTEES**Bucknell University**

Bryce Reimer – Mechanical Engineering ‘24
 José Juarez – Mechanical Engineering ‘24
 Anthony Zamorra – Biomedical Engineering ‘23
 Sarah Vestal – Mechanical Engineering ‘24
 Jack Calisi – Psychology ‘23
 Ally Clarke – Biomedical Engineering ‘24
 Marianne Voigt – Biomedical Engineering ‘24
 Kyle Young – Mechanical Engineering ‘24
 Sabrina Lorza – Mechanical Engineering ‘23
 Minhaj Bhuiyan – Biomedical Engineering ‘23
 Jacob Schaefer – Mechanical Engineering ‘24
 Jaden Lee – Mechanical Engineering ‘23
 Emily Tully – Mechanical Engineering ‘21
 Olivia Dyer – Cell Bio/Biochemistry ‘22
 Thomas Matsumura – Neuroscience ‘22
 Kristen Fu – Mechanical Engineering ‘20
 Ruth Segall – Cell Bio/Biochemistry ‘21
 Elyssa Penson – Mechanical Engineering ‘21
 Anurag Vaidya – Biomedical Engineering and Computer Science Minor ‘21
 Keith Grega – Biomedical Engineering ‘21
 Sai Pranav Rallabhandi – Mechanical Engineering ‘21
 Joelle Andres-Beck – Mechanical Engineering ‘21
 Margo Yancey – B.S., Mechanical Engineering ‘19
 Christine Bendzinski – B.S., Cell Bio/Biochemistry ‘18

Geisinger Musculoskeletal Institute (co-advised)

Olivia Dyer – Pediatric Orthopaedic Research Assistant

Geisinger Commonwealth School of Medicine (co-advised)

Nathan Chaclas ‘24
 Calum Wallace ‘23
 John Coulter ‘23
 Sundeep Kahlon ‘23
 Mark Mandel ‘22

Arts et Métiers Institute of Technology (co-advised)

Thomas Lavigne – MS ‘22, PhD ‘25

Colorado State University

Aaron Drake – BS, MS, Mechanical Engineering
Alex Tomsick – BS, Mechanical Engineering

Other Institutions (co-advised)

Emma Gilmore – Biomedical Engineering '21, UMASS Amherst

Bucknell University Honors Thesis Committee

Anurag Vaidya – Computer Science '21

Bucknell University MS Committee

Lucas Rankin – Chemical Engineering '21
Soheil Habibian MS – Mechanical Engineering '19

Geisinger Commonwealth Medical Research Honors Program Committee

Jessica Koshinski '24

PROFESSIONAL MEMBERSHIPS

Council for Undergraduate Research	2020 – Present
American Society for Engineering Education	2018 – Present
Orthopaedic Research Society	2018 – Present
American Society of Biomechanics	2014 – Present
European Society of Biomechanics	2016 – Present
American Society of Mechanical Engineers	2012 – Present